Subject Index

A

Absolute value
  explanation of, 152
  method to find, 101
Acute angles, 565–566
Addends, 17, 19, 203
Addition
  associative property of, 18–19, 167, 669–670, 726
  on calculators, 25
  by carrying, 17–18
  commutative property of, 18, 19, 167
  of decimals, 344–350, 402
  distributive property of multiplication over, 670–672
  explanation of, 17
  of fractions, 254–257, 268–274, 312, 319
  given fractional replacement values, 256
  identities for, 672
  of integers, 108–112, 118, 153
  of mixed numbers, 292–294, 320
  of polynomials, 771–773, 804
  problem solving using, 23–25
  of radicals, 1153–1154, 1183
  of rational expressions, 910–911, 918–921, 954, 955
  repeated, 40–41
  of signed numbers, 109–110
  of whole numbers, 17–19, 86
  words and phrases for, 79–80, 193
Addition method
  explanation of, 1102
  to solve systems of linear equations, 1102–1105, 1125–1126
Addition properties
  of 0, 18
  associative, 18–19, 167, 669–670, 726
  commutative, 668–669, 726
  of equality, 143–145, 154, 175–178, 186–187, 203, 307
  of inequality, 715–716, 718–719
Additive inverse, 117, 672–673. *See also* Opposites
Adjacent angles, 567
Algebra goals. *See* Study skills
Algebraic expressions
  evaluation of, 75–78, 111, 285
  explanation of, 76, 88
  like terms in, 165–166
  method to simplify, 165–169, 203
  multiplication of, 168–169
Alternate interior angles, 568
Angles
  acute, 565–566
  adjacent, 567
  alternate interior, 568
  classification of, 565–566
  complementary, 566
  corresponding, 568
  explanation of, 563, 642–643
  measures of, 567–568, 692
  names for, 564
  obtuse, 565
  right, 565–566
  sides of, 563
  straight, 565–566
  supplementary, 566–567
  vertical, 567
Angle-side-angle (ASA) triangle, 527
Applications. *See* Applications Index; Problem solving
Approximation. *See also* Estimation; Rounding
  decimal, 1139
  of solutions to quadratic equations, 1211
  of square roots, 520, 522, 1139
Area
  of circles, 587–588
  formulas for, 584–585, 587, 643
  method to find, 585–586
  of parallelograms, 585, 586, 643
  of rectangles, 44–45, 87, 170, 584, 586–587
  of squares, 71, 88, 584
  surface, 588–592
  of trapezoids, 585
  of triangles, 383, 585
Associative properties
  of addition, 18–19, 669–670, 726
  of multiplication, 42, 669–670, 726
Average. *See also* Mean
  explanation of, 61, 87, 392, 404
  grade point average, 394–395
  investigation of, 725
  method to find, 61, 138

B

Bar graphs
  explanation of, 24, 494, 543
  integers in, 103
  method to read and construct, 24–25
  problem solving with, 494–496
Base
  explanation of, 68
  of exponential expression, 244, 739
Binomials. *See also* Polynomials
  explanation of, 762, 804
  factoring, 822
  FOIL method for, 785–789, 805, 828
  square of, 786–787, 805
Borrowing, subtraction by, 21–22, 294
Boundary lines, 1045–1047
Braces, 79, 659
Brackets, 69, 135
Break-even point, 1123

C

Calculators. *See also* Graphing calculators
  addition on, 25
  compound interest on, 476
  decimals on, 350
  division on, 61
  equations on, 189, 682, 1087
  estimation on, 371
  evaluating expressions at given replacement value on, 851
  exponents on, 72
  fractions on, 237, 274, 299
  mixed numbers on, 299
  multiplication on, 47
  negative numbers on, 112
  patterns on, 1023
  scientific notation on, 756
  simplifying expression containing fraction bar on, 138
  square roots on, 523, 1140
  subtraction on, 25
Capacity
  metric units of, 626–628, 645
  U.S. units of, 624–626, 645
Carrying, adding by, 17–18
Cartesian coordinate system. *See* Rectangular coordinate system
Celsius, Anders, 634
Celsius temperature, 634–636, 645
Centimeters, 605, 606
Circle graphs
  explanation of, 509, 544
  method to construct, 510–512
  problem solving with, 455, 510–512
Circles
  area of, 587–588, 643
  circumference of, 338, 360–361, 577–578, 643
  explanation of, 360, 402–403, 1241
Circular cylinders, 589
Circumference
  explanation of, 338, 360–361, 577, 643
  formula for, 577
  method to find, 360–361, 402–403
Class frequency, 496
Class interval, 496
Coefficients, numerical, 165–166, 203, 761
Commission problems, 468–469, 482
Common denominators, 254, 258, 910–911. *See also* Least common denominator (LCD)
Common factors, 891, 893
Commutative properties
  of addition, 18, 19, 167, 668–669, 726
  of multiplication, 42, 167, 668–669, 726
Complementary angles, 566
Completing the square
  explanation of, 1201
  to solve quadratic equations, 1201–1203, 1228
Complex fractions
  explanation of, 282, 320
  least common denominator of, 283–284, 946–948
  method to simplify, 282–284, 944–946, 956
Composite numbers, 229, 318
Compound interest, 475–476, 483
Compound interest formula, 476, 483
Cones, 589, 643, 1241

Congruent triangles, 526–528, 545
Conjugates
  explanation of, 1161, 1183
  rationalizing denominators using, 1159–1161
Consecutive integers
  even and odd, 693
  explanation of, 693
  solving problems with, 693, 868–869
Constant of proportionality, 1054, 1056
Constant of variation, 1054, 1055–1056
Constant terms, 165, 761
Constants, 165
Convex solids, 588
Coordinate plane. *See* Rectangular coordinate system
Corner point, 1256
Corresponding angles, 568
Counting numbers. *See* Natural numbers
Cross products, 235–236, 419, 448, 480
Cube roots
  explanation of, 1138, 1182
  method to simplify, 1148, 1154
Cubes
  area of, 643
  explanation of, 589, 1241
  factoring sum and difference of two, 1245–1246
Cubic centimeters, 588
Cubic inches, 588
Cubic units, 588

D

Data set range, 499–501, 544
Decimal approximation, 1139
Decimal point, 332, 337, 345, 402
Decimals
  addition of, 344–350, 402
  applications with, 392–396
  on calculators, 350
  comparison of, 335–337, 380–381
  division of, 366–371, 403
  equations containing, 387–389, 679–680
  estimating with, 347, 358, 369
  explanation of, 332
  method to round, 337–339, 402
  multiplication of, 357–360, 402–403
  on number line, 336–338
  order of operations, 381
  percents written as, 428–431, 481
  place value for, 332, 337, 401
  problem solving using, 348–349, 361, 370–371, 382–383
  problem solving with, 431–432
  rational and irrational numbers written as, 663
  as replacement values, 347–348, 360, 370, 383
  rounding of, 337–339, 402
  simplifying expressions containing, 348, 381–382
  in standard form, 334
  subtraction of, 344–350, 402
  used as replacement values, 347–348, 360
  words and phrases for, 332–334, 402
  writing fractions as, 378–380, 403
  written as fractions, 334–335
  written as percents, 428–429, 481
Decimals table, 1242
Decimeters, 605
Degrees
  of angles, 565–566
  of polynomials, 765, 804
Dekameters, 605
Denominators, 911–913. *See also* Least common denominator (LCD)
  common, 254, 258, 910–911
  explanation of, 215
  prime factorizations of, 233
  of rational expressions, 910–911, 918–921, 954, 955
  rationalizing the, 1159–1161, 1183
Dependent equations, 1086
Dependent variables, 1036
Descending powers, of polynomial, 762, 766
Difference of squares, 787–788, 849–850
Differences
  estimation of, 33–34
  explanation of, 19–20
Digits, 8
Direct variation, 1054, 1055, 1068
Direct variation problems, 1053–1056, 1058–1059
Discount problems, 469–470, 482
Dispersion, in statistics, 499
Distance formula, 703, 1181
Distance problems, 702–703, 938–939, 1251–1252
Distributive properties
  explanation of, 166, 727
  of multiplication, 42–43, 168–169, 204
  of multiplication over addition, 670–672
  to remove parentheses, 671, 680
  use of, 678
  used with radicals, 1153
Dividends, 53
Divisibility tests, 230–231
Division
  on calculators, 61
  of decimals, 366–371, 403
  explanation of, 52, 220–221
  with fractional replacement values, 247
  of fractions, 244–246, 318
  of integers, 126–127, 153
  long, 54–59, 87, 796–797
  of mixed numbers, 290–292, 320
  multiplication to check, 53, 54
  of polynomials, 795–798, 805
  problem solving using, 59–60
  properties of, 54, 87, 220–221
  of radicals, 1159, 1183
  of rational expressions, 902–904, 954
  of whole numbers, 52–61, 87, 290–292
  words and phrases for, 79–80, 193
Division properties
  of 0, 54
  of 1, 54
Divisor, 53, 57, 366
Domain, of relations, 1032, 1067

E

Edge, of polyhedron, 588
Elements, of set, 659, 726
Elimination method. *See* Addition method
Ellipses, 659
Equality
  addition property of, 143–145, 175–178, 203, 307
  of fractions, 235–236
  multiplication property of, 146–148, 154, 175–178, 204, 307
  squaring property of, 1168–1171
  words or phrases for, 193
Equality/inequality symbols, 438, 659–660, 717, 726
Equations. *See also* Linear equations in one variable; Linear equations in two variables; Quadratic equations; Systems of linear equations
  addition property of equality to solve, 154
  on calculators, 189, 682, 1087
  decimals in, 387–389, 679–680
  dependent, 1086
  equivalent, 1097
  explanation of, 78, 88, 438
  expressions vs., 142–143
  finding slope given, 1002–1004
  fractions in, 307–312, 320, 679–680, 707
  graphs of, 981, 986, 1010, 1018–1019
  of lines, 1018–1023, 1066–1067
  multiplication property of equality to solve, 154
  with no solution, 680–681
  ordered pairs as solution to, 971–973, 982–984
  parentheses in, 187–188
  percent, 439
  problem-solving steps for, 193–197, 202, 204–205, 404
  radical, 1168–1171, 1184
  rational, 936–939, 955–956
  rational expressions in, 925–929, 955
  solutions of, 78–79, 142–148
  to solve percent problems, 438–441
  steps to solve, 311, 320, 387
  using slope-intercept form, 1018–1020, 1066–1067
  writing sentences as, 188–189
Equilateral triangles, 1240
Equivalent fractions
  explanation of, 231–232, 318
  method to determine if fractions are, 235–236
  method to write, 231–235, 260–262
Estimation. *See also* Approximation; Rounding
  on calculators, 371
  to check answers, 290–292
  with decimals, 347, 358, 369
  problem solving using, 34–35, 985
  sums and differences, 33–34
Evaluating expressions
  explanation of, 68–69, 88, 137–138
  exponential, 68–69, 739–740
  given replacement values, 118, 127
Event, 536–537, 546
Exams, 5–6. *See also* Study skills
Expanded form, 11
Experiments, 535, 536, 546

Copyright 2019 Pearson Education, Inc.

Exponential expressions
base of, 244, 739
evaluation of, 68–69, 739–740
explanation of, 739
method to simplify, 741, 752–753
Exponential notation, 68
Exponents
on calculators, 72
explanation of, 68, 88
negative, 751–752, 803
power of quotient rule for, 744–746, 752
power rule for, 742–744, 752, 803
product rule for, 740–742, 752, 803
quotient rule for, 744–746, 752, 803
simplifying expressions containing, 135–137
summary of rules for, 803
zero, 745, 752, 803
Expressions. *See also* Algebraic expressions; Exponential expressions; Rational expressions
equations vs., 142–143
evaluation of, 76–77
explanation of, 76
terms of, 165–168, 203
translating word phrases into, 79–80, 179–180
Extraneous solution, 1169

F

Face, of polyhedron, 588
Factored form, 818
Factoring
binomials, 822
choosing appropriate strategy for, 856
difference of two squares, 849–850
explanation of, 229, 818, 876
by grouping, 822–823, 842–844, 876, 877
perfect square trinomials, 847–850, 877
to solve quadratic equations, 858–862, 878, 1194
trinomials of form $ax^2 + bx + c$, 835–838, 842–844, 877
trinomials of form $x^2 + bx + c$, 828–831, 877
Factoring out
explanation of, 818
greatest common factor, 818, 820–822, 831, 838–839
Factors, 41, 229
Factors common, 818, 891, 893. *See also* Greatest common factor (GCF)
Fahrenheit, Gabriel, 634
Fahrenheit temperature, 634–636, 645
First-degree equations in one variable. *See* Linear equations in one variable
First-degree equations in two variables. *See* Linear equations in two variables
FOIL method, 785–789, 805, 828
Formulas
for compound interest, 476, 483
containing radicals, 1175–1176
explanation of, 574, 702, 728
to find circumferences, 577
to find distance, 703, 1181
to find perimeters, 574–577, 643
to find velocity, 1176
to find volume, 589, 643, 706
for geometric figures, 584–585, 587, 589, 643, 1259
for quadratic equations, 1206–1210, 1229
solving formula for variable, 706–707, 728
solving problems with, 702–707
for vertex of parabolas, 1220–1223, 1229
Fraction bar
on calculators, 138
with complex fractions, 282
explanation of, 53, 135, 215
Fraction equivalents table, 1242
Fractional replacement values
addition and subtraction with, 256
evaluating expressions given, 272
multiplication and division with, 247
Fractions. *See also* Ratios
addition of, 254–257, 268–274, 312, 319
on calculators, 237, 274, 299
comparing decimals and, 380–381
complex, 282–286, 320, 944–948, 956
divisibility tests, 230–231
division of, 244–246, 318
in equations, 679–680, 707
equations containing, 307–312, 320
equivalent, 231–232, 235–236, 260–262, 318
explanation of, 215, 317
graphs of, 219–220, 290
improper, 217, 221–222, 317, 318
like, 254–257, 319
mixed numbers written as improper, 221–222
multiplication of, 242–244, 318, 900
on number line, 219–220, 290, 662
order of operations, 284–285, 320
percents written as, 428–431, 481
problem solving using, 247–248, 272–274, 382–383
problem solving with, 236, 431–432
proper, 217, 317
rational numbers as, 662
ratios written as, 417
from real-life data, 215–218
reciprocal of, 244, 245, 308, 309, 318
to represent parts of figures, 215–218
simplest form of, 232–235, 236, 318
simplifying expressions containing, 242–243, 381–382
subtraction of, 254–257, 268–274, 312, 319
unit, 601, 602, 606, 607, 614, 615, 618, 904
unlike, 254
writing decimals as, 334–335
written as decimals, 378–380, 403
written as percents, 428–431, 481
Frequency distribution graph, 496
Function notation, 1036–1038, 1067
Functions
domain of, 1067
explanation of, 1032–1033, 1067
graphs of, 1033–1036
identification of, 1032–1033
range of, 1067
vertical line test for, 1033–1036

G

Gallons, 624
Geometric figures. *See also specific figures*
formulas for, 584–585, 587, 589, 643, 1259
table of, 1240–1241
Geometric figures table, 1240–1241
Grade point average, 394–395
Grams, 617, 618, 644
Graphing calculators. *See also* Calculators
evaluating expressions at given replacement value on, 851
graphing equations on, 986, 996
patterns on, 1023
quadratic equations on, 1223
to sketch graphs of multiple equations, 1010
systems of equations on, 1087
Graphs
bar, 24, 103, 494–496, 543
circle, 455, 509–512, 544
of equation, 981, 986, 1010, 1018–1019
of fractions, 219–220, 290
of functions, 1033–1036
histogram, 496–498, 544
of horizontal and vertical lines, 995–996
of inequalities, 714–715
of integers, 100
line, 498–499, 543
of linear equations in two variables, 981–985, 1065
Graphs
of linear inequalities, 1044–1049, 1067–1068
ordered pairs on, 968–970, 1064
of parabolas, 1218–1223
pictographs, 493, 543
of quadratic equations, 1218–1223
slope-intercept form and, 1018–1019
to solve systems of linear equations, 1083–1086, 1124–1125
symmetric about the *y*-axis, 1218
of systems of linear inequalities, 1256–1257
tree diagrams, 535–536, 546
of whole numbers on number line, 32
Greatest common factor (GCF)
explanation of, 818, 876
factoring out, 818, 820–822, 831, 838–839
of list of terms, 819–820
Grouping
of addends, 19
in addition and multiplication, 167
associative properties and, 669
factoring by, 822–823, 842–844, 876, 877
of factors, 42
Grouping symbols, 69, 79, 135, 282

H

Half-planes, 1045–1047
Hectometers, 605
Histograms, 496–498, 544
Homework. *See* Study skills
Horizontal lines
equations of, 1023
explanation of, 995–996
graphs of, 995–996
slope of, 1005–1006
Hypotenuse, 521, 522, 869, 1174, 1175

I

Identities
  for addition and multiplication, 672–673
  explanation of, 672–673, 681
  with no solution, 680–681
Improper fractions
  explanation of, 217, 221–222, 317
  as mixed numbers or whole numbers, 221–222, 317, 318
  writing mixed numbers as, 222, 317
Inconsistent systems of linear equations, 1086
Independent variables, 1036
Index, 1138, 1182
Inequalities
  addition property of, 715–716, 718–719
  explanation of, 714, 728
  multiplication property of, 716–717
  on number line, 714–715
  solving problems modeled by, 719–720, 728
Inequality symbols, 100, 659–660
Integers. *See also* Signed numbers
  addition of, 108–112, 118, 153
  in bar graphs, 103
  comparison of, 100–101
  consecutive, 693, 868–869
  division of, 126–127, 153
  explanation of, 99, 152, 726
  graphs of, 100
  multiplication of, 123–126, 153
  negative, 661
  on number lines, 99, 108, 109, 152–153, 661
  positive, 661
  problem solving using, 111–112, 119, 127
  set of, 661
  subtraction of, 116–120, 153
Intercepts. *See also x*-intercepts*; y*-intercepts
  explanation of, 991, 1065–1066
  finding and plotting, 993–994
  horizontal and vertical lines and, 995–996
  identification of, 991–992
Interest
  compound, 475–476, 483
  explanation of, 473
  simple, 473–475, 483
Interest problems, 473–475
Interest rate, 473
Intersecting lines, 567, 568
Inverse variation, 1056, 1068
Inverse variation problems, 1056–1058
Inverses, additive or multiplicative, 672–673
Irrational numbers, 338, 662–663, 726, 1139
Isosceles trapezoids, 1240
Isosceles triangles, 1240

K

Kilograms, 617
Kilometers, 605, 606

L

Least common denominator (LCD)
  of complex fractions, 283–284, 946–948
  equations solved by multiplying by, 310–312
  explanation of, 258–260, 268, 319
  method to find, 258–260, 268–274, 911–913, 954
  to order or compare fractions, 271–272
  prime factorization and, 233, 259–260
  of rational expressions, 925–929
Least common multiple (LCM), 258–260
Legs, of right triangle, 521, 522, 869
Length
  metric units of, 605–608, 644
  U.S. units of, 601–605, 644
Length problems, 689–690, 703–705
Like fractions
  addition and subtraction of, 254–257, 319
  explanation of, 254
Like radicals, 1153
Like terms, 165–168, 203
Line graphs
  explanation of, 498, 543
  problem solving with, 498–499
Line of symmetry, 1218, 1229
Line segment, 563, 642
Linear equations in one variable. *See also* Equations
  addition and multiplication properties to solve, 186–187
  on calculators, 189
  containing decimals, 679–680
  containing fractions, 679–680
  explanation of, 186, 677
  parentheses in, 187–188
  problem-solving steps for, 193–197, 202, 204–205
  steps to solve, 677–678, 727–728
  writing numerical sentences as, 188–189
Linear equations in two variables. *See also* Equations*;* Systems of linear equations
  explanation of, 981
  forms of, 1023
  graphs of, 981–985, 1065
  slope-intercept form of, 1018–1020
  standard form of, 981, 982, 1023, 1065
Linear inequalities
  explanation of, 728, 1044
  graphs of, 1044–1049, 1067–1068
  in one variable, 718
  solution of, 1044
  steps to solve, 718, 728
  systems of, 1256–1257
  in two variables, 1044–1049, 1067–1068
Linear models, 1063
Lines
  boundary, 1045–1047
  equations of, 1018–1023, 1066–1067
  explanation of, 563, 642–643
  horizontal, 995–996, 1005–1006, 1023
  intersecting, 567, 568
  parallel, 567, 568, 1006–1007, 1023
  perpendicular, 567, 1007–1009, 1023
  slope of, 1001–1006
  vertical, 995–996, 1005–1006, 1023
Liters, 626, 627
Long division
  examples of, 55–59
  explanation of, 54, 87
  of polynomials, 796–797
Lowest terms, of fractions, 232–235, 318

M

Magic squares, 151
Map reading, 641
Mass
  metric units of, 617–619, 644
  units of, 617–619, 644
  weight vs., 617, 644
Mathematical statements
  explanation of, 659
  translating sentences into, 660
Mean
  explanation of, 392, 404
  method to find, 392–395
  weighted, 394
Measurement
  converting between units of, 904–905
  metric units of, 601, 605–608, 617–619, 626–628, 632–634, 644, 645
  summary of, 644–645
  U.S. units of, 601–605, 614–616, 624–626, 632–634, 645
Measures of central tendency, 392. *See also* Mean*;* Median*;* Mode
Median
  explanation of, 392, 395, 404
  method to find, 395
  position of, 500
Meters, 605, 606
Metric system. *See also* Measurement
  conversions between U. S. and, 632–634
  explanation of, 601
  units of capacity, 626–628, 645
  units of length, 605–608, 644
  units of mass, 617–619, 644
Milligrams, 617, 618
Milliliters, 605, 627
Millimeters, 605, 606
Minuend, 19–20
Mixed numbers
  addition and subtraction of, 292–294, 320
  on calculators, 299
  division of, 290–292, 320
  explanation of, 218
  as improper fractions, 221–222
  multiplication of, 290–292, 320
  negative, 296–298
  problem solving with, 295–296
  writing improper fractions as, 222, 317
Mixture problems, 1248–1249
Mode
  explanation of, 392, 395–396, 404
  method to find, 395–396
Monomials. *See also* Polynomials
  division of, 795–796
  explanation of, 762, 804
  multiplication of, 778–780
Multiplication. *See also* Products
  of algebraic expressions, 168–169
  associative property of, 42, 669–670, 726
  on calculators, 47
  to check division, 53, 54
  commutative property of, 42, 167, 668–669, 726
  of decimals, 357–360, 402–403

Copyright 2019 Pearson Education, Inc.

distributive property of, 42–43, 168–169, 204
explanation of, 40
with fractional replacement values, 247
of fractions, 242–244, 318, 900
identities for, 672–673
of integers, 123–126, 153
of mixed numbers, 290–292, 320
of monomials, 778–780
of polynomials, 778–780, 785–789, 804
problem solving using, 46–47, 127, 247–248
of radicals, 1157–1159, 1183
of rational expressions, 900–901, 903–904, 953, 954
as repeated addition, 40–41
of sum and difference of two terms, 787–788
of whole numbers, 40–47, 87, 290–292
words and phrases for, 79–80, 193, 247
Multiplication properties
of 0, 41
of 1, 41
associative, 42, 669–670, 726
commutative, 42, 167, 668–669, 726
distributive, 42–43, 168–169, 204, 670–672, 680
of equality, 146–148, 154, 175–178, 186–187, 204, 307
of inequality, 716–717
Multiplication sign, 41
Multiplicative inverse, 672–673, 727

N

Natural numbers, 8, 659, 726
Negative exponents
explanation of, 751–752, 803
simplifying expressions with, 752–753
Negative integers, 661
Negative numbers
explanation of, 99
mixed, 296–298
Negative square roots, 1137, 1182
Notation. *See* Symbols/notation
*n*th roots, 1138–1139, 1182
Number lines
decimals on, 336–338
explanation of, 11, 659, 726
fractions on, 219–220, 290, 662
graphs of, 32
inequalities on, 714–715
integers on, 99, 108, 109, 152–153, 661
opposites on, 102
square roots on, 520
whole numbers on, 11
Numbers. *See also* Integers; Real numbers; Signed numbers; Whole numbers
composite, 229, 318
finding unknown, 688–689, 1111–1112
irrational, 338, 662–663, 726, 1139
mixed, 218
natural, 8, 659, 726
negative, 99
positive, 99
prime, 229–231, 318
rational, 662, 726
signed, 99
Numerators, 215, 217, 233
Numerical coefficients, 165–166, 203, 761

O

Obtuse angles, 565–566
One
division property of, 54, 220–221
multiplication property of, 41
Opposites, 102, 153, 672. *See also* Additive inverse
Order of operations
with decimals, 381
examples of, 70–71
explanation of, 69, 88, 135, 154, 403
with fractions, 284–285, 320
Ordered pairs
data represented as, 970
explanation of, 968
on graphs, 968–970, 1064
method to plot, 971–973
as solution to equations, 971–973, 982–984
as solution to system of two equations, 1083, 1094, 1098
Organization skills, 2–3, 1266–1267. *See also* Study skills
Origin, 968, 1064
Original inequality, 1047, 1068
Ounces, 614, 615, 624
Outcomes, 535, 536, 546

P

Paired data, 970. *See also* Ordered pairs
Paired table values, 972
Parabolas. *See also* Quadratic equations
applications for, 1227
explanation of, 1218, 1229
graphs of, 1218–1223
vertex of, 1220–1223, 1229
Parallel lines
cut by transversal, 568
explanation of, 567, 1023
slope of, 1006–1007
Parallelograms
area of, 585, 586, 643
explanation of, 1240
Parentheses, 135, 187–188, 671, 680
Partial products, 44
Patterns, on graphing calculators, 1023
Percent decrease, 458–459, 481
Percent equations, 439
Percent equivalences table, 1243
Percent increase, 458–459, 481
Percent problems
equations to solve, 438–441
method to solve, 446–447, 481
proportions to solve, 447–449, 481
Percent proportion, 445, 481
Percents
circle graphs used to show, 509–510
decimals written as, 428–429, 481
explanation of, 428, 480
fractions written as, 428–431, 481
method to convert, 431–432
problem solving with, 431–432, 438–441, 447–449, 455–458, 467–470, 473–475, 482
use of, 428–429, 467
Percents
words and phrases for, 481
written as decimals, 428–431, 480
written as fractions, 428–431, 481
Percents tables, 1242, 1243
Perfect square trinomials
explanation of, 847, 877, 1201
factoring, 847–850, 877
Perfect squares, 520, 1139
Perimeter
of polygons, 22–23, 86, 574, 576
of rectangles, 574, 643, 705, 707
of squares, 575, 643
of triangles, 170, 575–576, 643
Periods, 9
Perpendicular lines
explanation of, 567, 1023
slope of, 1007–1009
π, 338, 379
Pictographs, 493, 543
Place value
for decimals, 332, 337, 401
explanation of, 8–9, 85
rounding whole numbers to, 32–33, 86
Plane, 563
Plane figures table, 1241
Point, 563, 589
Point-slope form
equations in, 1019–1020, 1066–1067
explanation of, 1019–1020, 1023
problem solving using, 1022–1023
Polygons
explanation of, 22, 1240
perimeter of, 22–23, 86, 574, 576
Polyhedrons, 588
Polynomials. *See also* Binomials; Factoring; Factors; Monomials; Trinomials
addition of, 771–773, 804
combining like terms to simplify, 764–765
degree of, 765, 804
descending powers of, 762, 766
division of, 795–798, 805
evaluation of, 763–764
explanation of, 762, 804
FOIL method to multiply, 785–789, 828
method to simplify, 764–765
modeling with, 802
multiplication of, 778–780, 785–789, 804
prime, 830
with several variables, 765
subtraction of, 771–773, 804
types of, 762, 804
Positive integers, 661
Positive numbers, 99
Positive square root, 519, 1137, 1182
Pounds, 614, 615
Power, 739
Power of product rule, 743, 752, 803
Power of quotient rule, 744, 752, 803
Power rule for exponents, 742–744, 752, 803
Powers of 10
division of decimals by, 369
multiplication of decimals by, 358–360
Practice Final Exam, 1278–1282

Prime factorization
explanation of, 229–231, 318
to find least common denominators of list of denominators, 233, 259–260
Prime numbers, 229–231, 318
Prime polynomials, 830
Principal, 473–475
Principal square root. *See* Positive square root
Probability
of event, 536–537, 546
explanation of, 535, 546
Problem solving. *See also* Applications Index
with addition, 23–25
with bar graphs, 494–496
with circle graphs, 455, 510–512
with consecutive integer problems, 693
with decimals, 348–349, 361, 370–371, 382–383, 431–432
with direct translation problems, 688–689
with division, 59–60
with equations, 193–197, 202, 204–205, 404
with estimation, 34–35, 985
with formulas, 702–707
with fractions, 236, 247–248, 272–274, 431–432
general strategy for, 688, 727–728, 878, 1111, 1248
with inequalities, 719–720, 728
with integers, 111–112, 119, 127
with mixed numbers, 295–296
with multiplication, 46–47, 127, 247–248
with percents, 431–432, 438–441, 447–449, 455–458, 467–470, 473–475, 482
with quadratic equations, 866–870, 878
with rational equations, 936–939, 955–956
with relationships among unknown quantities, 689–692
with square root property, 1197
with subtraction, 23–25
with systems of linear equations, 1111–1116, 1126
Product rule
for exponents, 740–742, 752, 803
power of, 743, 752
for radicals, 1145–1146, 1157–1158, 1182
Products. *See also* Multiplication
cross, 235–236, 419, 448, 480
explanation of, 41
partial, 44
special, 768–767
Proper fractions, 217, 317
Proportions. *See also* Ratios
explanation of, 480
identifying parts of, 445
percent, 445, 481
solving problems modeled by, 420–421, 481
solving problems with ratios, 418–419
Protractors, 511–512
Pythagorean theorem
explanation of, 521, 545, 869, 1174
use of, 521–522, 1174–1175

Q

Quadrants, 968
Quadratic equations. *See also* Parabolas
approximate solutions to, 1211
completing the square to solve, 1201–1203, 1228
with degree greater than two, 858–862
explanation of, 858
factoring to solve, 858–862, 878, 1194
on graphing calculators, 1223
graphs of, 1218–1223
problem solving with, 866–870, 878
quadratic formula to solve, 1206–1210, 1229
square root property to solve, 1194–1196
standard form of, 858, 1206, 1207
steps to solve, 1203
summary on solving, 1215–1216
in two variables, 1218–1223, 1229
Quadratic formula
explanation of, 1207, 1229
to solve quadratic equations, 1206–1210, 1229
Quadrilaterals, 1240
Quarts, 624, 625
Quotient rule
for exponents, 744–746, 752, 803
power of, 744, 752
for radicals, 1146–1147, 1159, 1183
Quotients
explanation of, 53
of like signs, 124
parts of, 56
of unlike signs, 124

R

Radical equations
explanation of, 1168
method to solve, 1168–1171, 1184
Radical expressions, 1137
Radical sign, 519, 1137, 1182
Radicals. *See also* Roots; Square roots
addition and subtraction of, 1153–1154, 1183
applications for, 1174
containing variables, 1139–1140, 1147
division of, 1159, 1183
introduction to, 1137–1140
like, 1153
method to simplify, 1139–1140, 1146–1147, 1153–1154, 1182–1183
multiplication of, 1157–1159, 1183
product rule for, 1145–1146, 1157–1158, 1182
quotient rule for, 1146–1147, 1159, 1183
rationalizing denominators and, 1159–1161
subtraction of, 1153–1154, 1183
use of formulas containing, 1175–1176
Radicands, 1137, 1147, 1153, 1182
Radius, 24
Range
of data set, 499–501, 544
of relations, 1032, 1067
Rate of change, slope as, 1009–1010, 1066
Rational equations
problem solving with, 936–939, 955–956
solving number problems modeled by, 936
Rational expressions
addition and subtraction of, 910–911, 918–921, 954, 955
common denominator of, 910–911, 918–921, 954, 955
complex, 944–946
converting between units of measure and, 904–905
division of, 902–904, 954
equations containing, 925–929, 955
evaluation of, 889
explanation of, 889, 953
least common denominator of, 911–913
method to simplify, 891–894, 953
multiplication of, 900–901, 903–904, 953, 954
subtraction of, 910–911, 918–921, 954, 955
undefined, 890
writing equivalent, 894, 913–914
Rational numbers, 662, 726. *See also* Fractions
Rationalizing the denominator
explanation of, 1159–1160, 1183
use of conjugates for, 1159–1161
Ratios. *See also* Fractions; Proportions
explanation of, 480
solving proportions with, 418–419
written as fractions, 417
Ray, 563, 643
Real numbers
explanation of, 681, 726
order property for, 660
properties of, 668–672, 726–727
set of, 663
Reciprocals. *See also* Multiplicative inverse
explanation of, 672, 727
of fractions, 244, 245, 308, 309, 318
method to find, 902
Rectangles
area of, 44–45, 87, 584, 586–587, 643
explanation of, 1240
perimeter of, 574, 643, 705, 707
Rectangular coordinate system
explanation of, 968, 1064–1065
ordered pairs and, 968–973
Rectangular solids, 589, 643, 1241
Relations, 1032, 1067
Remainders, 56
Repeated addition, 40–41
Repeated subtraction, 58–59
Replacement values
evaluating expressions at given, 851
use of decimals as, 347–348, 360, 370, 383
Rhombus, 1240
Right angles, 565–566
Right circular cones, 1241
Right circular cylinders, 643, 1241
Right triangles
explanation of, 521, 869, 1240
Pythagorean theorem and, 521–522, 869, 1174–1175
Rise, 1002
Roots. *See also* Radicals; Square roots
cube, 1138, 1148, 1154, 1182

Copyright 2019 Pearson Education, Inc.

explanation of, 1137
*n*th, 1138–1139, 1182
Rounding. *See also* Approximation; Estimation
of decimals, 337–339, 402
of whole numbers, 32–33, 86
Run, 1002

S

Sales tax, 467–468, 482
Scale drawings, 479
Scalene triangles, 1240
Scatter diagrams, 970
Scientific notation
on calculator, 756
conversion between standard notation and, 754–755
explanation of, 753–754, 803
performing operations with, 755
writing numbers in, 754
Sets
element of, 659, 726
explanation of, 659, 726
identifying common, 661–664
of integers, 661
of irrational numbers, 663
of rational numbers, 662
of real numbers, 663
of whole numbers, 79, 659
Side-angle-side (SAS) triangles, 527
Side-side-side (SSS) triangles, 527
Signed numbers. *See also* Integers
addition of, 109–110
explanation of, 99, 152
Similar triangles
explanation of, 528–530, 545
method to find unknown lengths of sides in, 529–530
Simple interest, 473–475, 483
Simplest form
of fractions, 232–235, 236, 318
problem solving by writing fractions in, 236
Simplification
of complex fractions, 282–284, 944–946, 956
of cube roots, 1148, 1154
of exponential expressions, 741, 752–753
of polynomials, 764–765
of radicals, 1139–1140, 1146–1147, 1153–1154, 1182–1183
of rational expressions, 891–894, 953
Slope. *See also* Point-slope form
explanation of, 1001, 1002, 1066
of horizontal and vertical lines, 1005–1006
methods to find, 1001–1006
as rate of change, 1009–1010, 1067
undefined, 1005–1006
writing an equation given a point and, 1019–1020
Slope-intercept form
explanation of, 1018, 1023, 1066
to graph equation, 1018–1019
to write equation, 1019–1020
Solid figures table, 1241
Solutions
of equations, 78–79, 88, 142–148, 1064
equations and identities with no, 680–681
extraneous, 1169
of linear inequalities, 1044
of systems of linear equations, 1083–1086, 1124
Space, 563
Special products
explanation of, 786, 805
FOIL method and, 785–789
squaring binomials and, 768–767
sum and difference of two terms and, 787–788
use of, 788–789
Special products formulas, 1159
Spheres, 589, 643, 1241
Square root properties
explanation of, 1195, 1228
problem solving using, 1197
use of, 1194–1196
Square roots. *See also* Radicals
applications of, 521
approximation of, 520, 523, 1139
on calculators, 523, 1140
explanation of, 519, 545, 1137
method to find, 519, 1137–1138
method to simplify, 1153–1154, 1182
negative, 1137, 1182
positive, 519, 1137, 1182
product rule for, 1145–1146, 1157–1158
quotient rule for, 1146–1147
solving radical equations containing, 1169–1170, 1184
table of, 1244
Square units, 45, 71
Square-based pyramids, 589, 643
Squares
of binomials, 786–787, 805
difference of, 787–788, 849–850
explanation of, 519, 1241
perfect, 1139
table of, 1244
Squares (geometric)
area of, 71, 88, 584, 643
perimeter of, 575, 643
Squaring property of equality
explanation of, 1168
used once, 1168–1170
used twice, 1171
Standard form
decimals in, 334
of linear equations in two variables, 981, 982, 1023, 1065
of quadratic equations, 858, 1206, 1207
scientific notation converted to, 754–755
whole numbers in, 11, 86
Statistics
data set range, 499–501, 544
dispersion, 499
position of median, 500
Stem-and-leaf displays, 542
Straight angles, 565–566
Study Guide Outline, 1272–1277
Study skills
attitude and, 2, 1263–1265
for exams, 5–6, 1264–1265, 1270
homework and, 1266–1270
MyLab Math and Math XL, 1268–1271
notebooks and, 4–5, 1267
organization skills and, 2–3, 1266–1267
seeking help and, 5, 1269, 1271
textbooks and, 3–4, 1271
time management and, 6
video resources, 4–5
Substitution method
explanation of, 1094
to solve systems of linear equations, 1094–1098, 1125
steps to solve, 1096
Subtraction
by borrowing, 21–22, 294
on calculators, 25
of decimals, 344–350, 402
explanation of, 19
of fractions, 254–257, 268–274, 312, 319
given fractional replacement values, 256
of integers, 116–120, 153
of mixed numbers, 292–294, 320
of polynomials, 771–773, 804
problem solving using, 23–25
of radicals, 1153–1154, 1183
of rational expressions, 910–911, 918–921, 954, 955
repeated, 58–59
of whole numbers, 19–22, 86
words and phrases for, 79–80, 193
Subtraction properties, of 0, 20–21
Subtrahend, 20
Sum or difference of two cubes, factoring, 1245–1246
Sums
estimation of, 33–34
explanation of, 17
Supplementary angles, 566–567
Surface area, 589–592
Symbols/notation
angle, 563
braces, 659
ellipses, 659
equality/inequality, 100, 438, 659–660, 717, 726
exponential, 68
function, 1036, 1067
grouping, 69, 79, 135, 282
line segment, 563
multiplication, 41, 438
P (point), 563, 589
parallel to, 567
percent, 428, 431, 432
perpendicular to, 567
pi, 338, 379
radical, 519, 1137
scientific notation, 753–754, 803
Systems of linear equations
addition method to solve, 1102–1105, 1125–1126
explanation of, 1083, 1124
graphing to solve, 1083–1086, 1124–1125
on graphing utility, 1087

Systems of linear equations (*continued*)
inconsistent, 1086
nongraph solutions to, 1086–1087
problem solving with, 1111–1116, 1126
solution of, 1083, 1124–1125
substitution method to solve, 1094–1098, 1125
Systems of linear inequalities
explanation of, 1256
graphs of, 1256–1257

T

Table of paired values, 972
Tables. *See also* Graphs
appendices, 1240–1244
reading of, 11–12
Temperature scales
conversion between, 634–636, 645, 704
explanation of, 634, 645
Terms
constant, 165, 761
explanation of, 165, 761, 804
of expression, 165–168, 203
like, 165–168, 203
variable, 165, 203
Test point, to graph inequalities, 1045
Tons, 614
Translation problems, 688–689
Transversal, 568
Trapezoids, 585, 643, 1240
Tree diagrams, 535–536, 546
Triangles
area of, 585, 643
congruent, 526–528, 545
explanation of, 1240
perimeter of, 170, 575–576, 643
right, 521–522, 869, 1174–1175
side-angle-side (SAS), 527
side-side-side (SSS), 527
similar, 528–530, 545
table of, 1240
Trinomials. *See also* Polynomials
explanation of, 762, 804
of form $ax^2 + bx + c$, 835–838, 842–844, 877
of form $x^2 + bx + c$, 828–831, 877
perfect square, 847–850, 877, 1201

U

Undefined, 54
Undefined expressions, 890
Undefined slope, 1005–1006
Uniform motion problems, 1251–1252
Unit fractions, 601, 602, 606, 607, 614, 615, 618, 644, 904
Unlike fractions
addition and subtraction of, 268–274, 319
explanation of, 254
problem solving with, 272–274
U.S. measurement system. *See also* Measurement
conversions between metric and, 632–634
units of capacity, 624–626, 645
units of length, 601–605, 644
units of weight, 614–616, 644

V

Variable terms, 165, 203
Variables, 75, 88
Variables dependent, 1036
explanation of, 659
function notation, 1036
in polynomials, 765
simplifying radicals containing, 1139–1140, 1147
solving equations for specified, 929
solving formula for, 706–707, 728
Variation
applications of, 1059–1060
constant of, 1054, 1055–1056
direct, 1053–1056, 1058–1059, 1068
inverse, 1056–1058, 1068
Velocity formula, 1176
Vertex
explanation of, 563, 564, 1218
of parabola, 1220–1223, 1229
Vertex formula, 1220–1223, 1229
Vertical angles, 567
Vertical line test, 1033–1036, 1067
Vertical lines
equations of, 1023
explanation of, 995–996
graphs of, 995–996
slope of, 1005–1006
Volume
explanation of, 588
formulas for, 589, 643, 706

W

Weight
explanation of, 614
mass vs., 617, 644
metric units of, 644
U.S. units of, 614–616, 644
Weighted mean, 394
Whole numbers
addition of, 17–19, 86
division of, 52–61, 87, 290–292
in expanded form, 11
explanation of, 8, 85, 726
graphs of, 32
multiplication of, 40–47, 87, 290–292
rounding of, 32–33, 86
set of, 79, 659
in standard form, 9–11, 86
subtraction of, 19–22, 86
words and phrases for, 9–10, 86
writing improper fractions as, 222
Words/phrases. *See also* Symbols/notation
for addition, 79–80, 193
for decimals, 332–334, 402
for division, 79–80, 193
for equality, 193
for expressions, 79–80, 179–180
for multiplication, 79–80, 193
for multiplication of fractions, 247
for percents with equations, 481
for subtraction, 79–80, 193
translated into variable expressions, 79–80
for whole numbers, 9–10, 86
Work problems, 937–938

X

x-axis, 968, 1064
x-coordinates, 1001, 1002, 1032, 1033
x-intercepts
explanation of, 991, 992, 1065
finding and plotting, 993–994
to graph quadratic equations, 1218

Y

y-axis, 968, 1064
y-coordinates, 1001, 1032, 1033
y-intercepts
explanation of, 991, 992, 1065
finding and plotting, 993–994
to graph quadratic equations, 1218

Z

Zero
addition property of, 18
division property of, 54, 220–221
multiplication property of, 41
subtraction property of, 20–21
Zero exponents, 745, 752, 803
Zero-factor properties, 858–862, 1194

Copyright 2019 Pearson Education, Inc.